

What Is Claimed Is:

- 1 1. A pharmaceutical composition for regulating bone-forming activity in a
2 mammal comprising at least one of (i) a secreted frizzled related protein (sFRP) or
3 regulating portion thereof (ii) an antibody against such proteins or portions thereof,
4 (iii) a nucleic acid that encodes for either (i) or (ii); (iv) an sFRP antisense nucleic
5 acid; or (v) a small molecule that has an effect on any of items (i)- (iv).
- 1 2. A pharmaceutical composition according to claim 1, wherein the sFRP is
2 from human osteoblast cells.
- 1 3. A pharmaceutical composition according to claim 1, wherein the bone
2 forming activity is the regulation of bone growth.
- 1 4. A pharmaceutical composition according to claim 1, wherein the bone
2 forming activity is regulation of bone density.
- 1 5. The pharmaceutical composition according to claim 1, wherein the sFRP is
2 sFRP-1.
- 1 6. The pharmaceutical composition of claim 1 wherein the composition
2 comprises an acceptable carrier or diluent.
- 1 7. A method for treating a bone disorder in a mammal comprising the steps of
2 administering a pharmaceutical composition as in claim 1.

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- 1 8. The method of treating the bone disorder of claim 7, wherein the disorder
2 comprises the group consisting of (a) a bone formation disorder, (b) a bone
3 resorption disorder, and (c) a bone density disorder.
- 1 9. The method of claim 7 wherein the bone disorder is a degenerative bone
2 disorder.
- 1 10. The method of claim 9 wherein the degenerative bone disorder is an
2 osteodegeneration disorder.
- 1 11. The method of claim 10, wherein the osteodegeneration disorder is selected
2 from the group consisting of osteopenia, osteoarthritis, osteoporosis.
- 1 12. The method of claim 7, wherein the mammal is a human.
- 1 13. A method for identifying a test compound that regulates sFRP activity, which
2 method comprises determining activity of sFRP incubated in a medium containing a
3 test compound, wherein an increase in activity relative to sFRP alone indicates the
4 compound is an sFRP activator and a decrease in activity indicates the compound is
5 an sFRP inhibitor.
- 1 14. The method of claim 13 wherein the sample comprises an immortalized
2 human osteoblast cell that expresses a temperature-sensitive mutant of simian virus
3 40 large T protein antigen, wherein the cell proliferates at about 34° C but does not

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4 proliferate at temperatures exceeding about 37°C, when the T-antigen mutant is
5 inactive.

1 15. The method of claim 14 wherein the immortalized human osteoblast cell is an
2 hOB-01-C1-PS-09 cell, as deposited with American Type Culture Collection in
3 Manassas, VA with the designation PTA-785, or progeny thereof.

1 16. A method of modulating Wnt-mediated signaling in a cell comprising
2 contacting the cell with the composition of claim 1, wherein the Wnt activity is
3 regulated.

1 17. The method of claim 16, wherein the sFRP of the composition is sFRP-1.

1 18. A method of facilitating bone formation or repair in a bone cell, comprising
2 introducing a recombinant construct expressing an antisense, siRNA, shRNA
3 sequence to a nucleotide sequence that encodes an sFRP-1 into bone cells.

1 19. A method of diagnosing a bone disease or disorder, the method comprising
2 using a polynucleotide probe capable of hybridizing with the polynucleotide having
3 the nucleic acid sequence set forth in SEQ ID NO: 1 to detect the presence or
4 absence of an sFRP in a sample derived from a mammalian host.

5 animal relative to the sFRP -/- animal indicates the compound is a modulator of
6 sFRP activity.

1 27. An immortalized human osteoblast (hOB) cell that expresses a temperature-
2 sensitive mutant of simian virus 40 large T protein antigen, wherein the cell
3 proliferates at about 34 °C but does not proliferate at temperatures exceeding about
4 37 °C, when the T-antigen mutant is inactive.

1 28. An hOB cell of claim 27 that expresses a nucleotide sequence encoding a
2 polynucleotide that encodes an sFRP or fragment thereof.

1 29. An hOB cell of claim 27 wherein the hOB is an hOB-01-C1-PS-09 cell, as
2 deposited with American Type Culture Collection in Manassas, VA with the
3 designation PTA-785, or progeny thereof.

1 30. A homogenous population of cells comprising the hOB cell of claim 27.

1 31. A method for preventing a bone disorder in a mammal, which method
2 comprises administering a pharmaceutical composition as in claim 1.

1 32. The method of preventing a bone disorder according to claim 31, in which the
2 disorder is a bone formation disorder, a bone resorption disorder or a bone density
3 disorder.

1 42. A method according to claim 41 in which the sFRP expression or activity is
2 inhibited by at least 20%.

1 43. A method according to claim 41 in which the sFRP expression or activity is
2 completely eliminated in the mammal.